Feasibility Study for the Development of the Ziibimijwang Farm

Introduction

With a goal of providing low to no cost organic vegetables to their citizens, thereby improving their overall health and well-being, the Little Traverse Bay Bands of Odawa Indians purchased the Ziibimijwang farm in Carp Lake, Michigan and then obtained a grant from the United States Department of Agriculture as part of their Local Food Promotion Program. Using the funds from this grant, the Band commissioned the Seven Generations team to perform an assessment of the farm that investigated the best options for direct marketing sales, with an emphasis on a Tribally Support Agriculture program. Over the course of the last four months, the Seven Generations team has visited the Ziibimijwang farm, as well as the Mdewakanton Wozupi farm operated by the Shakopee Mdewakanton Sioux Community, in order to get a complete picture of what resources are currently available and what the potential of these resources may be. This report covers an analysis of potential markets for products produced by the Ziibimijwang farm, the production potential of the farm, an assessment of resources currently available, an investigation of the potential operating models for this farm, and an overall analysis of the economic impact of the farm's operation.

Market Analysis

This section of the report analyzes the market potential and the potential economic impact of the Little Traverse Bay Band farm. The focus will be on different ways to position the farm products and to assess the different ways to sell the products. This is done with an emphasis on the values stated by the Band.

There are a wide range of vegetables and grain that could be grown on the farm. Some of the vegetables that could be produced include, but are not limited to, sweet corn, potatoes, tomatoes and squash. Wheat has good potential as a grain crop and field corn could also be produced. While the region isn't well suited to field corn, the demand for organic feed may be strong enough to offset the shortcomings of the farm as a corn producer. The farm is located on the border of Emmet and Cheboygan counties. Table 1 shows the acreage and output devoted to some of the crops in Emmet and Cheboygan counties that were discussed by the Band. It also includes the acreage and production as a percentage of total state production. Percentages are rounded to the nearest one tenth of one percent.

Table 1: Acres and Production of Selected Commodities Emmet and Cheboygan Counties 2012

Commodity	Acres	Output	Percent of State Total Acres	Percent of State Output
Corn	1,645	148,998 bushels	0.0	0.0
Dry Beans	0.0	0.0	0.0	0.0
Forage	25,515	31,771 tons	2.4	1.3
Wheat	296	14,365 bushels	0.0	0.0
Bell Peppers	14	NA	0.8	NA
Potatoes	25	NA	0.0	NA
Pumpkins	70	NA	1.2	NA
Squash	35	NA	0.5	NA
Sweet Corn	62	NA	0.6	NA
Sweet Potatoes	0.0	NA	0.0	NA
Tomatoes in the Open	14	NA	0.2	NA
Apples	63	NA	0.1	NA

Source: USDA Census of Agriculture; N/A = Not available

The data in Table 1 shows that this region is not a major producer of agricultural commodities. Long winters may depress yields and distance from markets may play a role. Nonetheless, there are some selective opportunities for success.

Dry beans have also been mentioned as a crop. While this is an excellent crop for use by members of the Band, due to the difficulty of cooking and preparing dry beans, its potential for direct sales to consumers is constrained. Using unprocessed dry beans is a four step process; they need to be cleaned rinsed and soaked before they can be cooked. Soaking takes between 4 to 24 hours and cooking takes between 30 minutes and two hours (Myrdal Miller). As a result of these factors, its value as a cash crop is relatively limited. This is particularly true for direct sales, which has the most potential for the Band's produce. There are also some maple trees on the farm that could be tapped and used for maple syrup.

It is estimated that a TSA needs to include upwards of 40 different types of crops per year. This requires a fairly sophisticated production and marketing system, which would be difficult for any beginning farm enterprise. However, it could be feasible to operate a TSA with less variety or as part of a diverse scheme of market options.

Nonetheless, there are several outlets available for the products produced by the farm. Farmers' markets and roadside stands have a great deal of potential, and these outlets are well suited to meet the demand of seasonal residents and summer tourists.

The economic impact of the venture is estimated to be approximately $195,000, and the number of employees is estimated to be approximately five. These numbers are based on the business plan provided by the Band.

Organic Foods

The Band has identified the production of organic foods as a fundamental value. Fortunately, the property can be used for organic food production from the start. Sales of organic products continue to increase, but the rate of increase is slowing down (Mintel, p.11). According to the Organic Trade Association, sales of all organic products were $39.1 billion in 2014 and now account for five percent of all food sales. This is partly due to their becoming mainstream products. In December of 2014, 44 percent of those surveyed purchased an organic product in the previous three months (Mintel, p. 33). The level of competition appears to be increasing as more large retailers, processors, and farms are beginning to offer organic products. Young people in particular are interested in buying organic products from large retailers (Mintel, p.12). One major concern that may constrain future growth is that many consumers believe organic food is an excuse to charge higher prices (Mintel, p.14).

One exception to some of these trends is fresh produce (i.e. fruits and vegetables). Sales of organic fresh produce increased by 40 percent between 2012 and 2014 (Mintel, p.23). Fruits and vegetables are the largest organic food category in terms of sales, and the Band is well positioned to sell organic vegetable and perhaps fruit products.

However, there is some level of confusion with respect to organic foods. Some consumers doubt the claims made by the makers of organic products, despite the fact that the U.S. Department of Agriculture (USDA) regulates organic practices. Other attributes, such as products that are not genetically modified (GMO free), locally produced and natural, may have more potential. It should be noted that some of these attributes can be stacked - for example both local and organic. Efforts could also be made to be as transparent as possible to insure consumers that the products are organic (Mintel, p.19).

The primary selling point for organic products is their perceived health attributes. Other factors such as environmental benefits are far less important to consumers (Mintel, p.8).

One underserved market is the organic animal feed market. In order to meet this need, the feed must also be organic. The vast majority of corn and soybeans (the primary feed crops) used as feed are genetically modified. The largest egg producer in the state appears to be interested in organic corn, but in order to meet this market, the farm may need to operate at a larger scale than the Band may be interested in.

Natural and Local

Another product claim that could be used to sell products is “natural”. Many consumers appear to confuse organic and natural, despite the fact that the definition of organic is determined by the federal government and natural claims are mostly unregulated. It is generally easier and less expensive to produce products that are considered natural. Organic is a good fit with the values of the Band. It could also be used with other product attributes. A Native American product could be unique and could be a selling point for the Band.

Also, products that are locally produced are attractive for a group of consumers. The growing interest in locally produced food was mentioned as a strength of the Band's business plan (Dyer). How this is marketed is the topic for the next section.

Outlets for the Products

There are several potential outlets for the vegetables. One outlet that has a great deal of potential is a roadside stand or market. If possible, a stand along US 31 would be a very good location, especially from June through October when traffic along the road is at its greatest. A roadside stand offers educational opportunities to members of the Band who are interested in entrepreneurship or in operating a business.

Another natural outlet for the products are farmers' markets located in the region. The business plan identified four farmers' markets in the region:

- Pickford – 57 miles
- Pellston – 11 miles
- Harbor Springs – 30 miles
- Petoskey – 30 miles

Since the publication of the business plan, the Pellston farmers' market has ceased operations. The Pickford market may be too far away given the fact that it is located in the Upper Peninsula. Harbor Springs and Petoskey probably have the most potential.

Petoskey has 26 vendors and is currently full. The focus is on natural products that a farmer can fish, forage or grow themselves or make with 90 percent of their own resources. The rent is $15 per week or $275 for the 16 week season for a 10x10 space or $25 per week or $275 per season for a 10x20 space. The market would like to add a goat cheese, fresh chicken, or beef vendor. There are currently two vendors that are selling organic produce.

Harbor Springs has 36 vendors. On a typical day, there are 1,200 customers at the market and most producers appear to do well in terms of sales. The market is open from 9:00 to 1:00 on Wednesdays and Saturdays. One vendor sells organic produce. The market manager is not opposed to additional organic produce and might be interested in unique organic products, but is most interested in chicken. This market strives to offer a relatively wide range of products to provide a good experience to buyers and to minimize competition between vendors.

One alternative is for the Band to operate its own Farmers' market. The Saginaw Chippewa Band has recently broken ground for a new farmers' market on its reservation. According to the Band's website, food vendors do not have to be native, but sellers of art do. The Band was able to obtain a $200,000 grant from the USDA to build the farmers' market pavilion. It should be noted that the Saginaw Chippewa Band is relatively large and located in Mt. Pleasant, which is a larger city.

It should be noted that selling at a farmers' market does require a relatively high level of commitment. Someone will have to be there through the market's season. A roadside stand and space in the farmers'

market also require a truck for transportation and a table or some other structure. The person staffing the stand or the farmers' market also needs to be reasonably good at making change and interacting with customers.

Marketing through a farmers' market or a roadside stand would allow the Band to sell all of its produce. It would also allow the farm to specialize in a few vegetables with a strong built-in demand, such as sweet corn and tomatoes. Maple syrup is another product with a strong demand.

Restaurants are another potential market. The interest in locally produced food has led some restaurants to look for locally sourced produce. However, restaurants are price sensitive, are fairly demanding with respect to quality, and need a sufficient quantity to meet their needs.

There also appears to be some potential with respect to wheat and forage crops. Organic wheat commands a premium price, but growing it may be difficult given the different wheat diseases prevalent in Michigan. Deoxynivalenol, or vomitoxin, is a particular problem. However, a baker and a potential miller who are interested in the wheat the Band might grow have been identified. Organic hay also has a strong market potential. Horse owners in the area are likely to be interested in an organic high quality product. In order to meet the needs of these owners, the bales should be small to make handling easy. The farm could either transport the bales to their customers or the owners could pick them up them at the farm.

To be successful, a traditional TSA will need to produce a wide range of produce – in the range of 40 different types a year – to meet consumer expectations. Although this may not be immediately feasible given the shortage of labor, a TSA could be developed with a smaller number of vegetables or as part of a large scheme of diverse market options. Selling to farmers' markets or through a roadside stand could be an effective part of this.

It should be noted that there are some farms that sell at least some of their output using a CSA in the general region, mostly in the vicinity of Traverse City, although at least one of them does have a delivery point in Petoskey. The Traverse City region is a hot bed of the local food movement. One farm in the region, 9 Bean Rows, sells 42 different types of fresh produce, although it only sells two types of beans, fava and lima. Some of the CSAs also sell eggs, chicken and pork, fruit and flowers as well as vegetables. Many of the CSAs in the area are certified organic or use low chemical input management practices. Most of the farms utilizing CSAs use additional means to sell their output. This includes direct sales, sales via farmers' markets, sales to schools and sales to restaurants.

Prices vary widely and are dependent on the size of the order and the length of the season. For example one CSA in the region charges $770 for 22 weeks of produce for four or more people and $572 for a small share for two to four people. A large share for 18 weeks costs $665 and a small share costs $495.

While it is difficult to determine whether or not the market is saturated, given the interest in CSAs, there is probably some additional room for growth, although it is likely the case that other market channels may also need to be utilized.

Supply Analysis

Financial Needs

The Band would like to supply organic foods to its Tribal citizens at either low or no cost and to offset the financial demands of that project with sales from the farm. The Band does not need to earn a profit from its farming enterprises, but rather aims to break even while meeting the primary goal of providing healthy organic foods to the Tribal community.

The basic cost of annual operations is outlined in the March 2014 Farm Business Plan and includes labor, supplies, and farm overhead, totaling $46,183 per year ($21,780 for the cost of the basic box and $24,403 for farm overhead). This number does not include the cost of equipment purchase, which needs to be considered in farm start-up costs, but will not be an on-going farm expense beyond maintenance.

Production for the Band

The Band previously contracted with a local farmer, one Mr. Berg, to produce corn, tomatoes, peppers, potatoes, melons, and squash for about 200 Tribal citizens to harvest through a u-pick arrangement. Mr. Berg did all the planting and maintenance of the crops and harvested and sold a portion of them through his own markets. The food was not organic. The Band would like to produce organic food for about that same number of citizens (200) through a similar harvest arrangement on the Ziibimijwang farm, though they are concerned that it will be more difficult to draw people out to the more remote farm location. As their citizens are accustomed to the food being free for the harvesting, the Band does not expect to be able to charge for the food in the future. The Business Plan estimates 3 acres of production to go directly to the Band.

Farm Current Status and Potential

The farm has more than enough acreage for fresh vegetable production, and the potential for other crops in addition to the vegetables. Though the soil quality and potential productivity are outside the realm of this report, the sheer number of acres available makes the possibility for soil building through active cover cropping a real strength for the vegetable operation. In addition, cover crops can be used to suppress weeds and are an aid in bringing beneficial and pest insect populations into balance in an organic system (Clark, 2007 p. 9 – 11)

Weeds, insect pests, fertility, and disease control are the four main concerns within any cropping system. They are especially of concern within an organic system where chemical controls are not an option. Overall ecosystem balance is the key to success in organic agriculture and is greatly enhanced by the use of diverse and well managed cover crops. The rich land resource available at the Ziibimijwang farm will make using cover crops and maintaining the organic integrity of the farm system easier than it would be otherwise.

Since the farm has been fallow and has had no prohibited products applied to it in the last three years, it will be able to be certified for organic production as soon as the Band is ready to do so. The Band will

just need to insure that it does not apply any prohibited products in order to maintain the land's certifiability.

Infrastructure

Existing infrastructure includes a house, barn, various additional outbuildings, and access to a creek for irrigation. Infrastructure needed for vegetable production includes the following in rough order of priority:

- **Wash Shed/Pack Shed** – potable water, sinks and/or tanks for hydro-cooling, screen tables for spraying, hoses, separate hand-washing station, storage area for harvest crate and boxes, etc. See Hendrickson, 2013, p. 42 for a simple pack shed layout. See *Resources* section for links to more information on layouts, equipment, and post-harvest handling. The washing/packing area can be set up in one of the existing buildings as long as there is access to potable water (for washing) and adequate drainage, there are no animals/animal droppings and the space can be easily cleaned (for food safety), and the cooler is nearby.
- **Cooler** – size will need to be large enough to accommodate the projected harvest in five years and small enough to be able to cool efficiently. 8-ft by 12-ft or 16-ft is a common size for farms starting out with about 3 acres. In time, a second cooler of about the same size can be built and set at a somewhat warmer temperature to accommodate more crops for more acres at their optimal storage temperature. Typically a primary cooler is set at 32 to 34 degrees Fahrenheit and is used for all crops that need to be cooled even through the low temperature is best suited for greens, carrots, beets, peas, broccoli, etc. Eventually, a secondary warmer cooler might be set at around 45 or 50 degrees and used for crops that are more optimally stored at that temperature, such as beans, peppers, basil, etc. See Bachmann, 2000, Appendix I for a list of optimal storage temperatures. As a simple, affordable alternative to traditional refrigeration equipment, a coolbot (see *Resources*) can be used to trick an air conditioner to cool down to about 34 degrees Fahrenheit. Many small farms use coolbots as a way to get started and for their warmer coolers in the long-term.
- **Irrigation** – the Band already has access to a creek, permission to pump, and a pump and pipes to do the job. Within the vegetable area, additional equipment will be needed to provide both overhead and drip irrigation to the crops. See *Resources* section for links to more information on irrigation.
- **Greenhouse** – estimate 200 to 300 square feet per acre of vegetables (Hendrikson, 2013, p. 34); include a germination chamber that can accommodate the largest weekly seeding (likely about 150 to 200 flats for 3 acres, plus plant sale); consider a head house for making potting soil, seeding, and storage; need heat in the form of a heater and/or passive solar elements; benches; watering system
- **Equipment Storage** – It will be important to protect equipment from the elements in order to keep it in good working order. Storage in existing buildings should be adequate.
- **Hoophouse** – for season extension and/or a protected growing area for crops like tomatoes, peppers, cucumbers, basil, etc. might be a later addition for the farm if there is interest.

Equipment

In order to best take advantage of the rich land resource on the farm, it is important to get as much of the farm as possible into cover crops (or hay) as soon as possible. Fortunately, cover crops are fairly easy to manage when land is not limited and covers can remain in place for longer periods of time. Equipment for managing cover crops, however, is a high priority and includes:

- **Seeder** – a grain drill or 3 point broadcast spreader will be best, but some work can be done with a hand broadcast seeder on up to 4 acres (see *Resources)*. A 3 point broadcast spreader can also be used to spread soil amendments and some forms of compost, which could be a plus.
- **Tiller** – a 60-inch or 72-inch rotovator will be needed for the vegetable operation and can also be used for preparing ground for cover crops, working in the seed for germination (if broadcasting rather than drilling seed), and killing cover crops as needed.
- **Mower** – a 60-inch or 72-inch mower of some kind will be needed for taking down spent vegetable crops and can also be used for cover crop maintenance. Either a flail chopper (which will make smaller, more easily incorporated and digested pieces) or a rotary mower (which will leave larger pieces and will not mow as evenly) will work.
- **Tractor** - also necessary to pull these implements and can be sized to pull other implements for vegetable production, such as the transplanter and mulch layer.
- **Chisel Plow** – will eventually be needed for primary tillage both for cover crops and vegetables. One of the larger tractors that the farm already owes can be used to pull a 5 or 7 shank chisel plow. The tractor needed for the other tasks listed above will likely be too small to pull the chisel plow.

Additional equipment needed for vegetable production:

- **Pickup truck or van** – for moving supplies and harvested vegetables around the farm as well as for taking produce to markets. A tractor with a wagon can also work on farm, but will not work for produce deliveries.
- **Seeder** – a push seeder like the Earthway precision garden seeder (see *Resources*) is very common and useful. These seeders can also be ganged together to plant multiple rows at one time as seen at the Wozupi farm. A Jang seeder (see *Resources*) is another, more expensive and more precise option that can work well, especially when planting only a limited number of crops. A tractor drawn seeder or a multi-row push seeder will make cultivating with tractor drawn equipment much easier.
- **Hand Cultivation Tools** – on the small scale hand tools are very effective and are typically needed even when a farm is using a great deal of mechanical cultivation. Links for wheel hoes, scuffle hoes, and hand hoes are all included in the *Resources* section.
- **Mechanical Cultivation Tools** – There are a variety of styles and types available. The best tools for the farm will be dependent on other factors such as planting tools, spacing, bed sizes, etc. Weeding can demand a great deal of labor. Using cover crops and mechanical cultivation to control weeds will be very helpful as the farm grows.
- **Transplanter** – water wheel transplanters are the most common on smaller vegetable farms. Typically a farm under 3 or 4 acres will transplant by hand much like what was seen at the

Wozupi farm where markers on the back of the tiller set row spacing and make mechanical cultivation easier. A transplanter can save on labor, but is not essential at the small-scale.

- **Mulch Lifter** - the farm already has a plastic mulch layer which will save labor in laying the mulch down. Picking up the plastic mulch at the end of the season is required and can be quite difficult. A mulch lifter is not required, but could be very helpful if the farm uses the mulch layer.

Additional equipment for hay and/or row crops:

- **Seeder** – a grain drill will be best and can also be used to seed cover crops
- **Mower Conditioner –** can be used to cut the hay
- **Hay Rake –** puts the cut hay into rows
- **Hay Tedder –** aids in drying and conditioning the hay
- **Square Baler –** binds the hay into bales
- **Combine** - used to harvest crops such as corn and wheat

Many of these activities could be hired out to local farmers who already have the experience and the equipment. It would also allow the band to reduce initial equipment costs until it decides whether or not it wants to crop these crops every year. Capital costs for some of these activities could be quite high.

Labor

The current labor structure on the farm consists of a hired farm manager working 40 hours per week on average, with more hours required during the planting and harvest season, and comparatively few hours in the late fall and winter, supplemented by volunteers from the Band. The farm manager is primarily responsible for production, while the Tribal citizens harvest on a u-pick arrangement, with extras being delivered to the Tribal Center for distribution to the elders.

Labor is a real limiting factor on any farm, especially a vegetable farm. While many new growers understand the basics of production, few realize just how much time will be spent on harvest and post-harvest handling. Typically 50% or more of vegetable farm labor is spent on these tasks (USDA, 1964, Table 6). While implements like a mulch layer, transplanter, and mechanical weeders can save time on the production side, there are very few ways to mechanize harvesting and post-harvest handling on a diversified vegetable farm. Having a well-designed and efficient pack shed will help, but post-production labor will be essential regardless of equipment or facilities. In addition, selling vegetables through any market channel (farm stand, farmers' market, CSA, or direct wholesale) requires extreme care in post-harvest handling to ensure that products are of the quality needed to satisfy customers and keep them coming back.

Contracting with a skilled farm manager with proven knowledge of organic vegetable production, harvest and post-harvest handling, labor management, and marketing will be essential for the success of the farm. Some options for labor structure are outlined in the Alternatives Analysis section.

Vegetable Farm Scale

Estimates of how many CSA shares can be produced per acre vary widely and are dependent on the size of the share, farming style, soil fertility, and farmer skill. Obviously, more small shares can be produced per acre, than large shares. Also, more intensive, hand-scale production will produce more shares per acre than a mechanized approach, as will higher levels of fertility and skill. Data from the 2014 FairShare annual survey of 50 CSA farms showed a range of 5 to 100 CSA shares per acre with an average of 48 shares per acre (not adjusted for share size). New and beginning CSA farms should expect to produce fewer shares per acre starting out.

The Band's goal of producing a basic box of vegetables for about 200 Tribal citizens will likely take 3 to 5 acres with a mix of hand and machine labor, which is roughly consistent with the estimates in the business plan. As the farm matures, it should be able to produce more food on the same number of acres and increase the number of citizens served without major changes in equipment or infrastructure. With experience, farm labor will become more efficient and skilled. With time and good management, the land should become more productive.

Vegetable Crop Mix

The current mix of vegetables grown for Tribal citizens includes corn, beans, squash, tomatoes, peppers, potatoes, watermelon, broccoli, and cauliflower. These vegetables are used both for fresh eating and preservation/storage. The Band does not seem to currently have a demand for greens or root crops such as lettuce, kale, radishes, carrots and beets among its citizens. Crop mix for use by the Tribal citizens will need to be based on current demand with the potential to diversify that demand as the farm matures.

The vegetable crop mix for market will need to be based on both the market demand and the resources of the farm. Starting out with a smaller number of crops that overlap with the demand from the Band and that are popular in the market would be wise. Basing initial market sales on vegetables that grow well at the farm will be a foundation for success both on the production and marketing sides. Some more specific options for vegetable crop mix and marketing channels are outlined in the Alternatives Analysis section.

Non-Vegetable Crop Mix

Some non-vegetable crops need further processing or an identified buyer. For example, in order to profitably grow organic feed corn, a buyer needs to be identified. The largest egg producer in the state is interested in buying organic feed, but their operation is located some distance from farm.

This is also true for food crops such as wheat which needs to be further processed into flour. The primary wheat market in the area appears to be bakeries. Wheat straw could be sold to hunters and others who are interested in buying bedding. Barley is another crop with some potential, as there is a firm interested in establishing a malt house in Traverse City. On the other hand, hay could be sold directly to consumers, which may make it easier to establish a market.

Alternatives Analysis

As stated by the Band, growing healthy organic foods for the tribal community is the main objective of the Ziibimijwang farm project. This alternative analysis will focus on how to support that goal both financially and operationally with a basic gross income goal of $46,183 as calculated in the March 2014 Farm Business Plan.

Alternatives Considered

- **Basic Box** – This component is the driving force behind any operating model the farm may adopt. The current approach of hiring a farmer to grow vegetables for Tribal citizens and requiring those citizens to harvest for themselves has the benefit of relying on staff to produce the crop and on the citizens to do the bulk of the labor in the form of harvesting. As labor is one of the most limiting factors at the farm, this approach is both a logical and reasonable place to start. It also has the side benefit of bringing citizens out to the farm for exercise and relationship building with each other and the land. Drawbacks of this approach include: possible loss of crops due to poor harvest timing and/or post-harvest handling, reduced opportunity to take vegetables to market for cash, possible difficulties bringing citizens out to the new and more remote farm location.
- **Market Vegetables** – Selling additional vegetables from the farm is one option for earning money to support the basic box. Markets can include farmers' market, a CSA or TSA, restaurants, and/or a roadside stand. Each of these markets have benefits and drawbacks as outlined below. One advantage of moving into market vegetables is that there will be a natural synergy with the equipment and skills needed for the basic box. As the farm manger and the Band gain equipment and experience with crops for the basic box (as will be required to meet the main goal of the Band) those assets will also benefit any market vegetable endeavor. The major disadvantages of market vegetables are the need for skilled labor with expertise in a wide range of vegetable crops, and the time needed both to develop and serve the local market for those crops.

- **Farmers' Market** – Benefits: flexible (can bring only what is available from the farm when it is available), opportunity to build a reputation in the community which can benefit other possible marketing channels in the future. Drawbacks: labor invested in actually being at the market can be very high, sales are often dependent on factors outside the control of the Band such as weather and market popularity.
- **CSA or TSA** – Benefits: reliable and stable income based on pre-season marketing and sales, opportunity to build a supportive community of buyers who are loyal to the farm. Drawbacks: wide range of 35 to 50 different crops are typically required to attract and retain members, high level of production and harvesting skills required for each of those crops, commitment to regular and high quality communications with members.
- **Restaurants** – Benefits: will often purchase a higher volume of crops in one delivery thus reducing marketing labor, can focus on just a few crops that the Band does well, and can capitalize on tourist dollars and interest in local items on the menu. Drawbacks: requires very high quality, can be hard to get a foot in the door and high level of follow through required to stay in the door.
- **Grocery Stores** – Benefits: same as restaurants typically with even higher volume, and reduced attraction for tourist dollars. Drawbacks: same as restaurants with even higher quality requirements.
- **Roadside Stand** – Benefits: flexible, as with farmers' market. Drawbacks: same as with famers market plus the added difficulty of attracting customers without the assistance of an established market.

- **Spring Plant Sale –** Much like the market vegetables component, selling bedding plants in the spring is a way to earn money on activities the Band will need to do anyway for the basic box. Good quality organic bedding plants can fetch a high price when demand is strong. The Wozupi Tribal Gardens reported grossing $40,000 in a 3.5 day plant sale over the Mother's Day weekend in the Minneapolis, MN area market. Individual organic tomato plants in the Madison, WI area markets can range from $2.00 to $4.00 per plant in 2-inch to 4-inch pots. Plants can be sold at farmers' markets and/or at a spring event on the farm combined with other activities.
- **Grain Crops** – Benefits: can be used on less productive ground and would allow most of the farm acreage to be used. Hay would improve the quality of the soil. There appears to be a strong market for organic wheat and forage. Disadvantages: high equipment cost; this would likely require the use of custom planting and harvesting until the band makes a commitment to these crops.
- **Hay** – The Band can begin to earn money off of hay fairly quickly if there is a good market in the area. The price of alfalfa varies considerably from year to year, but is generally in the range of $125 per ton. The price of certified organic hay at least 10% to 20% more than conventional hay but will likely only be valuable to certified organic farms required to feed organic hay.
- **Horses** - According to the 2012 Census of Agriculture, there were 522 farms that had horses. The total number of horses on those farms was 3,643. This does not appear to include the horses on Mackinaw Island. There are approximately 300 horses on Mackinaw Island, most of them draft horses.

- **Maple Syrup** – Depending on the number of trees, maple syrup has potential especially for direct sales via a roadside stand, farmers market or TSA. The price tends to be relatively high at approximately $45 per gallon. While not the most efficient method, harvesting can be as simple as a tap and a bucket. The primary drawbacks are the cost and effort of reducing the sap to syrup and the potential labor needed to harvest produce and bottle the syrup.
- **Agritourism** – This option seemed especially attractive to the Band during our conversations. According to the Band, the previous farm owner ran a corn maze and pumpkin patch for about six weeks each fall and brought in a gross of about $60,000 in that time through school tours and family visits. If the Band can duplicate this success with no more than $13,800 in expenses related to the endeavor, this option alone should cover the cost of the basic box. The obvious advantage of this model is the ability to cover all the basic box expenses in a very short period of time each year. Possible difficulties include the need to market the service and attract customers to the farm, prepare the farm for visitors including facilities for restrooms, and staff the farm during the busy season. One additional drawback could be that Tribal citizens feel displaced at the farm when tourists and locals descend upon it for events.

  Michigan prices for this type of agritourism seem range from $7.00 per person for a group tour and activities on the low end with additional fees of $1.00 for a small pumpkin or a snack; and $10.00 for individuals in a family on the high end. (See *Resources* for links to some farms offering these services in Michigan. Prices are taken from these sites.) At these rates, the farm would need to serve about 1,000 individuals as families and an additional 6,250 students in school groups to gross $60,000. Further market research into the population and pricing possibilities in the area of the farm are required to assess if this option is worth pursuing.

  Agritourism appears to be growing in the state. According to Michigan Agritourism, there are 253 farms engaged in this activity. There is only one farm in Emmet County, two in Charlevoix County, and one in Cheboygan County.

  Hard numbers on the potential of agritourism in the area are difficult to obtain. In 1996, it was estimated that spending on tourism in Cheboygan, Chippewa, Emmet, Mackinac, and Schoolcraft counties was in excess of $632 million. The number of overnight stays in these counties was in excess of 10 million. Most of the spending and overnight stays were in Chippewa and Mackinac Counties (Holochek et al). The number has likely grown since then.

  In 2000, it was estimated that there were 835,000 visits to Mackinac Island. If the Band could get one percent of that business and the average sales were $20, the total revenue of the agritourism facility would be $167,000.

  Tourism in the region is also seasonal. There is little activity before May, and November and December are also slow months. The biggest tourism months are July, August and June, although September is also strong (Holochek et al). This has the advantage of being consistent with the growing season for most types of fresh produce.

Additional benefits of agritourism at the farm include:

- Opportunity for offerings unique to the Band: education on the Little Traverse Bay Band local history, native foods, and other subjects including art, culture, etc.
- Possibility of serving and charging for a snack made from foods grown at the farm and/or unique to the Band: maple syrup, corn cakes, etc.
- Opportunity for axillary sales of products served or sampled at the event: soup mix, corn cake mix, maple syrup, cider, etc.
- Possibility of establishing and promoting other events outside of the fall season, perhaps a maple syrup event or a summer event based on the heritage and culture of the Band.
- Can capitalize on local demand for events and education as well as tourist dollars

Labor Options

- **Farm Manager** – Having a skilled and committed farm manager is essential to any labor structure or operating model that the Band may choose. The farm manager will be responsible not only for growing food, maintaining equipment, and managing necessary hired or volunteer labor, but also for helping set priorities and make decisions that will impact the success of the operation. The particulars of what the Band should look for in a farm manager are somewhat dependent on which operating models the Band is most interested in pursuing. The particulars of how successful the farm will be, no matter the chosen operating model, are highly dependent on the skills, experience, connections, and ambitions of the farm manager.
- **Farm Crew** – Any farm manager will need additional labor to grow and harvest vegetables for the basic box. More labor will be required to pursue market vegetables, a plant sale, and/or the agritourism components, and may be required for the other operating model components as well. The farm manager will need to have skills and experience in training and supervising farm workers.
    - **Volunteers**
        - Basic Box – Currently Tribal citizens harvest their own vegetables for the basic box at no cost beyond the work of the harvest. These volunteers will continue to be needed in any farm operating model unless citizens start to pay for food from the farm. Options for expanding the program include 1) requiring volunteers to harvest beyond their own needs for sale at the market; 2) charging a small fee for access to the u-pick food and offering options to waive that fee in exchange for work in other farm enterprises beyond the vegetables including possible educational offerings at a fall pumpkin pick.
        - Worker Shares – Many CSAs have a worker share program where members volunteer on the farm for about 4 hours per week during the harvest season in exchange for a share. These worker shares may harvest, but also may work on myriad other farm tasks like planting and weeding. This type of volunteer program tends to work best if there is a standard offering of vegetables each week (as distinct from the u-pick arrangement).

- **Hired Crew** – The real advantage of hiring labor is that the farm manager will be able to schedule, train, and rely on paid labor much more than is possible with volunteers. Of course the drawback is the added expense, payroll requirements, and the possible need for additional insurance. But having even 1 or 2 people who work 1 or 2 days a week can be a real help for planting, weeding, and other production tasks outside of harvest.
    - Youth – Young people on summer vacation who can work just 1 or 2 days a week can be a real asset to the farm, especially if they are also Tribal citizens who have a connection to the land and community beyond a summer job. If they are at the farm every week they should become more faster and more efficient as they learn the systems.
    - Experienced Leaders – People with farm hand-labor experience and experience supervising crews who are then also trained on the particular systems at the farm will be especially valuable. In addition to being productive workers themselves, they could be put in charge of smaller volunteer crews thus multiplying their effectiveness and enabling the farm to take better advantage of larger numbers of volunteers on any given day. Having a few leaders working with smaller groups of 2 to 5 workers is generally more efficient than having larger crews getting in each other's' way on specific tasks. These experienced workers could be drawn from existing volunteer crews and/or young workers who have proven themselves to be hard-working and willing to learn.
    - Full Hired Crew – Many farms operate with only hired staff. They have decided that it is more economical to hire and train workers they can count on than it is to devote time to volunteers who require a great deal of supervision and are often not reliable. While it is certainly not where the Ziibimijwang will start out, it is worth noting that at some point the Band may decide that hiring more skilled labor is the most efficient option.

Additional Notes on Typical Progression of Starting a CSA/TSA

1. Hire a skilled manager with experience in CSA or with solid production and marketing experience or a wide range of vegetable crops.
2. Design shares to meet the needs of the local market. All shares should include regular weekly communications from the farm in the form of a weekly newsletter, blog post, or other accessible from. Share possibilities in rough order of recommended priority:
    a. Market Shares – Members buy a "share" at the beginning of the season and get a credit at the market stand for 110% of the price of the share. The extra 10% is the incentive for buying the share. Members shop at the farm stand from all available crops using their credit through the season. Product selection should include a wide range of crops, but can also be forgiving if there are crop failures.
    b. Preservation Shares – Members buy the share at a set price and receive much larger quantities of a smaller number of crops specifically for canning and freezing. One week might be 20 to 40 pounds of broccoli, the next could be 20 to 40 pounds of shell peas, then green beans, basil, tomatoes, peppers, etc.

c. Storage Shares – Members buy the share at a set price and receive 2 to 6 boxes of storage crops on a weekly or biweekly basis.
d. Standard and Every-Other-Week Shares – These are the most common in the CSA world and consist of a weekly or bi-weekly share of 7 to 12 different crops.

3. Start small and recruit friends and family to be the first members. Be clear that the first couple of years will not be perfect. These early members should plan to be forgiving of mistakes and also offer ideas on what could improve the customer experience of the program.
4. Maintain a farmers' market presence as a way to sell excess produce, build a reputation, and recruit future members.
5. Build on successes to refine share offering and grow the CSA at a reasonable pace over the years.

Putting It All Together

A great deal of the success of any farm is based in the skills, experience, connections, and passions of the farm management. There are any number of operating models that can work if the right people are working on them. That said, what follows is one possible option, with a focus on the stated interests and priorities of the Band.

Year One (2015) - Band

- Develop a job description for a farm manager with an emphasis on experience in organic vegetable production and skills in leading crews of inexperience workers. Begin hiring process with a goal of filling the position no later than January or February of 2016.
- Design and begin work on farm harvest infrastructure (pack shed and cooler) and greenhouse.
- Seed as much of the agricultural land as possible to alfalfa hay. The exact seed mix should be based on both the needs of the soil (weed control and soil building) and the local market for hay. If equipment, farmer skills, and know how are in place, the Band can start earning money from hay sales in 2016 while also preparing the land for possible conversion to other crops.
- Design and make plans for seeding a prairie in close proximity to the vegetable field. A prairie seeding will provide habitat for beneficial insects and will thus be a great benefit to the organic vegetable operation. It could also be an attraction for farm visitors
- Observe and record success and challenges of vegetable production for the basic box as a basis for improving production in the future.
- Identify and flesh out the details of an agritourism event to begin in 2016. Given the previous success with a fall pumpkin patch and maze, it seems that would be a good place to start.
- Identity and trial possible snacks that could be used in lieu of a donut as part of the agritourism plan. Ideally the snack will be reasonably healthy, have the potential to use ingredients grown at the farm, have the potential to be sold as a take-home item from the farm and/or sold to grocery stores and restaurants in the area, and be culturally significant to the Band.

Year Two (2016)

Farm Manager

- Design vegetable crop rotation based on desired crop mix and the Band's experience on the farm in 2015. The plan should include a cover crop rotation that takes full advantage of the rich land resource at the farm. Incorporating a wide variety of cover crops into the design and allowing for multi-year stands of cover crops where possible will be highly beneficial to the soil and the organic farming system overall.
- Develop vegetable crop plan and planting schedule to serve 200 Tribal citizens with the basic box and excess bedding plants and vegetables to serve a local farmers' market and possibly restaurant accounts. A focus on storage crops may be wise as they allow more flexibility with market timing as long as the farm has adequate storage facilities.
- Design and layout the vegetable field based on vegetable crop rotation, cover crop rotation, and equipment access and turning. Identifying an area of the farm for a pumpkin patch and corn maze will also be important if the Band decides to pursue that potential income stream.
- Develop schedules and materials to assist with managing volunteers on the farm: set work and harvest schedules; tool organization and signage, harvest manual (see *Resources* section for source materials and templates), etc.
- Manage all production at the farm in accordance with organic standards. Research options for organic certification and be prepared to apply when necessary/appropriate for marketing purposes.
- Grow vegetables for about 200 Tribal citizens with an emphasis on storage crops and planned excess that can be sold through farmers' market, restaurants, and/or on-farm sales to be coordinated with potential public events on the farm.
- Train and supervise farm labor (likely volunteers) to assist with the work on the farm.
- Organize and follow through on non-vegetable tasks such as making and selling hay, exploring options for grain production and markets, and other tasks related to the business plan.
- Agritourism: Plant and maintain a pumpkin patch and/or corn maze or other agritourism area as defined by the Band in 2015.
- Assess existing markets and make plans for beginning a small CSA/TSA in 2017 to serve Tribal citizens who want more than the basic box, regular customers at market, other friends and family who can be a solid and forgiving customer base at the beginning.

Band

- Work with farm manager to identify the best labor model for the year (likely volunteers) and require volunteers to fill those roles.
- Seed the prairie in cooperation with the farm manager and/or other local resources.
- Agritourism: Finalize the recipe and production plan for the simple snack to be used at events and possibly sold as a take-home item as well. Eventually some ingredients for the snack should come from the farm, and the snack should be designed with that in mind, but off-farm ingredients can be sourced until the farm is ready to provide them.

- Agritourism: In coordination with the farm manger, finalize the extended event plan to include educational elements (for schools and adults) related to the Bands history and/or culture; fun elements for kids (hay rides, scavenger hunts, etc.); and salable products from the farm.
- Agritourism: Recruit and train volunteers to help with the events.
- Develop attractive and informative logo, literature, and social media materials to promote the products and activities of the farm.

Year Three to Year Five (2017 - 2019) - Farm Manager

- Continue farm operations and crop production with an eye toward developing the market in the most lucrative directions.
- Develop farm labor plan to incorporate more hired staff if necessary to accommodate market demand.

Economic Impact Analysis

The economic impact analysis is derived from the Farm Business Plan prepared by Larry Dyer. The sales figures were used to estimate the total economic impact in Michigan. IMPLAN, a standard economic impact software package was used to generate the results. These are shown in Table 2, and only include the value of the farm products. The direct impact is the sales; the total impact includes indirect impacts (spending on related industries and inputs) and induced impacts (household spending on the general economy). These figures are estimates and are designed to give the Band an idea of the potential impact that the farm would have on Michigan's economy. The actual impact on output and employment will be different.

Table 2: The Economic Impact of the Farm Operation

Activity	Direct Impact	Total Impact	Impact on Employment
Vegetable Production	$ 54,984	$ 104,128	3
Grain and Pasture Production	52,130	91,130	2
Totals	**$ 107,114**	**$ 195,258**	**5**

The employment figures may be slightly understated. IMPLAN uses traditional agricultural practices that minimize the amount of labor used. The labor figure is for the Michigan economy as a whole and included direct, indirect, and induced employment.

Total sales are expected to be in the range of $107,000, of which approximately $55,000 is in vegetable production and $52,000 in in grain and pasture production. The total economic impact is estimated to be approximately $195,000.

It should be noted that this is based on using 10 acres for vegetable production and 78 acres for grain and pasture production. As additional acres are brought into production, additional revenue and employment will be generated.

Summary

The farm is well suited to provide some level of food sovereignty for the Band and earn a profit. Organic/local/GMO free produce are options that can be used to market the output and are in keeping with the values stated by the Band. Direct sales of vegetables and perhaps fruit have excellent potential and as noted, there are several options for this, including a TSA, a roadside stand, farmers' markets, and/or restaurant sales. While the capital costs are high, direct sales of maple syrup also present an opportunity given the amount of tourist and seasonal resident traffic.

Overall, the Band has a rich resource on their hands with the Ziibimijwang farm. As noted in the report, there are a variety of options that can be implemented to help meet the Band's goal of producing low to no cost organic produce for their citizens. Although the suggested plan of action in this report outlines one potential option for reaching this goal, there are various alternatives that have been investigated and can be implemented, depending on the available resources and general consensus of the Little Traverse Bay Band of Odawa Indians.

Resources

Guide to Marketing Channel Selection: How to Sell through Wholesale & Direct Marketing Channels from Cornell University Cooperative Extension, Tompkins County:
http://www.nebeginningfarmers.org/files/2012/04/Market-Channel-Assessment-132dr2l.pdf

Directory of Michigan Agritourism from Michigan Agritourism Association:
http://www.michiganfarmfun.com/index.php?option=com_content&view=article&id=13&Itemid=17

Examples of Michigan farms offering pumpkin patches and/or corn mazes:

- http://www.debuckscornmaze.com/index.php
- http://grandmaspumpkinpatch.com/
- http://johnsonsgiantpumpkins.net/index.html

Michigan Organic Food and Farm Alliance: http://www.moffa.net/farm-guide.html Includes a list of organic farms in Michigan, can be useful for finding markets for organic feed crops produced on the farm.

Roxbury Farm in Kinderhook, NY has extensive resources on crop plans, a crop manual, a harvest manual, and more. These resources are useful for details on specific crops as well as some broader philosophical explorations of equipment purchases and soil fertility plans:
http://www.roxburyfarm.com/100-member-csa-plan

FairShare CSA Coalition in Madison, WI has information specific to CSAs as well as general vegetable production information. See especially the Conference/Workshop Materials section:
http://www.csacoalition.org/our-farms/resources-for-farmers/

Financial benchmarks: https://www.extension.iastate.edu/agdm/wholefarm/html/c3-65.html

Packing Sheds and Coolers

Overall: http://www.growingformarket.com/articles/vegetable-packing-shed

Layout: http://www.growingformarket.com/articles/vegetable-packing-shed

Hands-free washer: http://bse.wisc.edu/HFHP/tipsheets_pdf/hndsfree4web.pdf

Coolbot: http://storeitcold.com/

Post-Harvest Handling:

http://bse.wisc.edu/HFHP/tipsheets_html/postharvest.htm

http://www.wnc.edu/files/departments/ce/sci/postharvesthandling.pdf

Wholesale Success: A Farmer's Guide to Food Safety, Selling, Postharvest Handling, and Packing Produce: http://www.familyfarmed.org/publications/wholesalesuccess/

Equipment

Earthway Precision Garden Seeder: http://earthway.com/product/1001-b-precision-garden-seeder.ashx

Jang Seeder: http://www.johnnyseeds.com/p-8739-jang-td1-precision-seeder.aspx

Earthway Broadcast Seeder (for cover crops): http://earthway.com/product/2750-nylon-bag-seeder-spreader.ashx

3 Point Broadcast Spreader (EXAMPLE only, brand not necessary recommended):

http://www.landpride.com/products/112/fsp-series-spreaders

Valley Oak Wheel Hoe (narrow blades for weeding in bed and wide blades for aisles): www.valleyoaktool.com

Stirrup Hoe, (various sizes available): http://www.johnnyseeds.com/p-5496-5-stirrup-hoe.aspx?utm_source=froogle&utm_medium=CSE&utm_campaign=MerchantAdv&zmam=80483139&zmas=1&zmac=1&zmap=9500.0&gclid=CL_Nr8bM78YCFZKBaQodXZ0HiA#

Labor

Examples of worker share programs:

http://www.vermontvalley.com/worker-shares/

http://www.crossroadscommunityfarm.com/csa-information/worker-shares/

http://wordpress.forestrunfarm.com/workers-shares/

References

https://owl.english.purdue.edu/owl/resource/560/10/

Bachmann, J., & Earles, R. (2000). *Postharvest Handling of Fruits and Vegetables*. ATTRA Publication #IP116. Available online at https://attra.ncat.org/attra-pub/viewhtml.php?id=378#postharvest Accessed 13 July 2015.

Clark, A. (Ed.) (2007). *Managing Cover Crops Profitably*. College Park, MN: Sustainable Agriculture Research and Education Program.

Dyer, L. Little Traverse Bay Band of Odawa Ad-Hoc Agricultural Assessment Work Group Farm Business Plan – Parcel 54, March 2014.

Hendrickon, J. (2013). *Perspectives on Fresh Market Vegetable Farming: Scale, Income, Labor, and Quality of Life* [PDF document]. Retrieved from http://rusk.uwex.edu/files/2013/01/Farming-for-Profit-Session-2013-Handout-Version-1.pdf

Mintel. *Organic Food and Beverage Shoppers – US*. Chicago: Mintel, March 2015.

Myrdal Miller, A. *Cooking with Dry Beans*, The Bean Institute.

Plotkin, J. (1999). *Use of Cover Crops and Green Manures to Attract Beneficial Insects*. Retrieved from: http://ipm.uconn.edu/documents/raw2/Use%20of%20Cover%20Crops%20and%20Green%20Manures%20to%20Attract%20Beneficial%20Insects/Use%20of%20Cover%20Crops%20and%20Green%20Manures%20to%20Attract%20Beneficial%20Insects.php?display=print

Ray, D.F. and H.D. Schaffer. "Opinion: Consumers Control GMO Debate", *The Daily Yonder*, May 15, 2015.

USDA. (1964). *Labor used to produce vegetables, estimates by states, 1959*. Stat. Bull. No. 341, Econ. Res. Serv., Wash., DC. Retrieved from: http://ageconsearch.umn.edu/bitstream/153764/2/sb341.pdf

U.S. Department of Agriculture *A Farmers Market Soars in Michigan*. http://blogs.usda.gov/2015/07/09/a-farmers-market-soars-in-michigan/